

Elakatothrix Americana, N. SP. Forming gelatinous, lacinate and anastomosing masses, several cm. long, attached to other plants. Cells more oval than in *E. gelatinosa* Wille; the cell divides across the middle, but the daughter cells grow obliquely past each other, causing irregularity in the structure of the thallus. Length of cells 12–25 μ ; breadth 6–11 μ . — Found at Monroe, Conn., May 30, 1895; collected by Miss Grace Angeline Smith.

CHRISTIANIA, NORWAY.

FURTHER NOTES ON NEW ENGLAND ANTENNARIAS.

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THE Antennarias, it may well seem, have received during the past two years more than their share of attention in the literature of American systematic botany; yet so active have been three New England botanists during the past May and June that much more has been added to our knowledge of that group. In Vermont President Ezra Brainerd, of Middlebury College, has made an exceedingly thorough study of the plants in the field; while Mr. W. W. Eggleston of Rutland, Vermont, and Mr. J. C. Parlin of North Berwick, Maine, have both made critical notes and collections. These careful observations have extended the known ranges of many formerly recognized New England species, and in Maine and Vermont a novel plant with marked and apparently constant characters has been collected. The following notes based primarily upon the collections above referred to may be considered supplementary to the two papers already published upon the genus *Antennaria* in New England.¹

Antennaria ambigens (*A. arnoglossa*, Greene, var. *ambigens*, Greene, Pittonia, iii. 320; *A. Parlinii*, Fernald, var. *ambigens*, Fernald, Proc. Bost. Soc. Nat. Hist. xxviii. 244). This plant formerly given only varietal recognition is now elevated without hesitation to specific rank. Though it bears some purple glands like those of *A. Parlinii*, in all its other characters — the dull pubescent upper surfaces of the basal leaves, the arachnoid glandless upper faces of the cauline ones, and the subcapitate inflorescence — it differs strikingly from that species. In

¹ Proc. Bost. Soc. Nat. Hist. xxviii. 237–249; RHODORA, i. 71–75.

its subcapitate inflorescence of large heads it more nearly resembles Professor Greene's *A. Farwellii*; but that species is quite glandless and its basal leaves are characteristically narrower than those of *A. ambigens*. This species, too, is near *A. fallax*, Greene, but that is a much taller glandless plant with more scattered cauline leaves and looser corymbs.

A. FALLAX, Greene. In a recent note (RHODORA i. 74) I included under this species a number of northern New England specimens. More recently, however, I have been able to examine one of Professor Greene's specimens, which is well matched by a New England plant, though not by all the specimens formerly cited by me. At that time I took for *A. fallax* a plant with the basal leaves as green and generally as glabrous as those of *A. Parlinii*. True *A. fallax*, however, has the basal leaves definitely gray-pubescent above, and the greenish or tawny (not purple) involucre bracts have scarious or petaloid tips. This plant has been examined from the following New England stations, the central Maine specimens formerly referred to *A. plantaginea* belonging here: — MAINE, gravelly bank, Orono, June 7, 1897 (*Geo. B. Fernald*); rich grassy slope, Orono, June 3, 1898 (*M. L. Fernald*, no. 2346); North Berwick, May 30, 1899 (*J. C. Parlin*, no. 1149): NEW HAMPSHIRE, roadside thickets, Jaffrey, May 31, 1897 — remarkably large specimens (*E. L. Rand* and *B. L. Robinson*, nos. 414, 415): VERMONT, in partial shade, Weybridge, May 21 and June 1, 1899, low open woods, in clay soil, Ferrisburgh, June 4, 1899 (*Ezra Brainerd*, nos. 15, 16): MASSACHUSETTS, dry pine woods, Wilmington, June 11, 1899 (*G. G. Kennedy*).

The plant with bright green leaves, formerly confused with *A. fallax* appears, upon an examination of more material, to belong rather with *A. Parlinii*, var. *arnoglossa*. The specimens referred to *A. fallax* were quite glandless, a character which, at that time, was considered sufficient to separate the plant specifically from *A. Parlinii*. Abundant material recently examined shows, however, that occasionally a few glands occur, and that, with no other characters to distinguish it, the plant must be considered

A. PARLINII, var. *ARNOGLOSSA*, Fernald, Proc. Bost. Soc. Nat. Hist. xxviii. 244. New England specimens examined: — MAINE, sandy field, Milo Junction, June 6, 1898, gravelly bank, Orono, June 4, 1898 (*M. L. Fernald*, nos. 2344, 2342, 2345); Somesville, July 2, 1897 (*E. L. Rand*); North Berwick, May 28, 1899 (*J. C. Parlin*): NEW

HAMPSHIRE, hillside, Jaffrey, May 31, 1897, — leaves arachnoid above (*E. L. Rand* and *B. L. Robinson*, no. 424) : VERMONT, Willoughby, June 10, 1898 (*G. G. Kennedy* and *E. F. Williams*) ; low open woods, Ferrisburgh, June 4, 1899 ; roadside, Waltham, May 21, 1899, roadside, Weybridge, May 23 and June 3, 1899, New Haven Mills, May 25, 1899, Addison, May 27, 1899, Chipman Hill, Middlebury, May 31, 1899 (*Ezra Brainerd*, nos. 14, 48, 52, 54, 56, 59) : MASSACHUSETTS, Williamstown, June, 1898 (*J. R. Churchill*) : CONNECTICUT, wooded bank, New Haven, May 17, 1898 (*A. W. Evans* and *M. L. Fernald*).

A. FARWELLII, Greene, Pittonia, iii. 347. Professor Greene based this species upon a very immature specimen collected in northern Michigan by Mr. O. A. Farwell. Better developed specimens sent from Michigan by Professor C. F. Wheeler have been identified with one of Mr. Farwell's specimens, and there is little doubt that this is the plant which has been collected at various stations in northern New England and Canada.

The species may be briefly characterized as follows : Stems stout, mostly rather low, occasionally 3.5 or 4 dm. tall : basal leaves 4.5 to 8 cm. long, gray above with nearly permanent pubescence, spatulate or narrowly obovate-spatulate, with rounded tips, conspicuously 3-nerved ; cauline leaves from lanceolate to oblanceolate, usually rather conspicuous : inflorescence subcapitate, or the heads on only short pedicels : involucre 8 to 10.5 mm. high, the bracts about 3-seriate, from lanceolate to oblong, with conspicuous white tips, the outer obtuse, broader than the inner bluntish or acute ones. In New England known from MAINE, dry sterile soil, North Berwick, June 4, 1899 (*J. C. Parlin*, no. 1157) : NEW HAMPSHIRE, barren ledges in open woods, lower slopes of Mt. Deception, Fabyan, June 20, 1898 (*E. F. Williams*) ; Alstead, July 4, 1898 (*M. L. Fernald*) : VERMONT, abundant about Middlebury, May 20, 1880, May and June 1898, 1899 (*Ezra Brainerd*, nos. 29, 30, 39, 42, 46, etc.) ; New Haven, May 21, 1899 ; Cornwall, May 23, 1899 ; Addison, May 27, 1899 (*Ezra Brainerd*, nos. 31, 34, 37) ; Rutland, June 2, 1899 (*W. W. Eggleston*). Also examined from ONTARIO, fields about Ottawa, June, 1898 (*J. M. Macoun* in Herb. Can. Geol. Surv. no. 18,809), and from MICHIGAN, sterile fields and bluffs, Keweenaw Co., April, 1884 (*O. A. Farwell*) ; campus, Agricultural College, June 9, 1898 (*C. F. Wheeler*). A very handsome and well-marked species, in habit nearest resembling *A. ambigens*, but quickly distinguished from that by its basal leaves, etc. (see above).

A. Brainerdii. With the habit of true *A. plantaginea* (*A. decipiens*, Greene); the stems slender and mostly rather low, 2 or 3 dm. high, bearing purplish glandular hairs mixed with the white flocculent indument: basal leaves dull, almost permanently arachnoid-pubescent above, the older sometimes becoming glabrate, obovate to orbicular-obovate tapering gradually to a slender petiole and, including it, 1.5 to 4.5 cm. long, 0.75 to 2 cm. broad; cauline leaves scattered, linear-lanceolate, small, arachnoid above: heads corymbose as in *A. Parlinii*: involucre 6 or 8 mm. high, the bracts 3-seriate, white-tipped, the outermost oblong, blunt, green or tawny and lanate below, the innermost attenuate. In clay soils, VERMONT, Barber's meadow, Addison, May 27, 1899, north of Birch Hill, New Haven, June 2, 1899, open meadows, New Haven, June 3, 1899, low woods, Ferrisburgh, June 4, 1899 (*Ezra Brainerd*); Bald Mt., Shrewsbury, alt. 460 m., June 6, 1899 (*W. W. Eggleston*): MAINE, dry open hickory and pine woods, and on a sandy exposed bank, North Berwick, June 4, 1899 (*J. C. Parlin*, nos. 1170, 1155). In general aspect this plant suggests a very small *A. plantaginea*, but the basal leaves are much smaller than is usual in that plant or in the related species, *A. Parlinii*, *A. fallax*, and *A. ambigens*. In foliage alone it has an equally strong resemblance to *A. neodioica*, the pubescent basal leaves being no larger than in the well developed plants of that species. From *A. plantaginea* it is further distinguished by the very abundant purple glandular hairs, like those of *A. Parlinii*, and by its larger heads with broad white-tipped bracts. To *A. Parlinii*, *A. Brainerdii* bears but little superficial resemblance, the small, dull, arachnoid-pubescent basal leaves, the small more scattered arachnoid, not glandular, cauline ones rendering it habitally very different, although in its bracts it is very close to *A. Parlinii*, var. *arnoglossa*. From *A. ambigens*, too, this species differs strikingly in its small basal leaves, and its very much smaller and more scattered cauline ones. Its nearest ally perhaps is *A. fallax*, but that is generally a much taller plant with larger leaves, glandless stem, and much narrower and more scarious involucre bracts.

Since the publication in 1898 of my synopsis of the New England Antennarias, such modification and expansion of the treatment there presented has been necessary that the following key to the species as now understood will perhaps be of some service: —

Stolons assurgent.

Basal leaves and those at the tips of the stolons bright green above, glabrous from the first, or at most only slightly arachnoid when very young, soon quite glabrate.

Basal leaves large, 5 to 12 cm. long, broadly obovate or obovate-spatulate, obtuse or rounded at tips.

Stems and stolons bearing many purplish glandular hairs: cauline leaves very glandular above: involucre bracts all scarious, mostly acute, the inner long-attenuate *A. Parlinii*.

Glands generally fewer or absent: outer bracts with broad white petaloid tips, the inner acute, but not so attenuate, *A. Parlinii*, var. *arnoglossa*.

- Basal leaves small, 2 to 5 cm. long, spatulate or obovate-spatulate, acute or obtuse.
 Bracts linear or linear-lanceolate, chartaceous below, petaloid or scarious above, the outer acute or obtuse, the inner attenuate, *A. canadensis*.
 Bracts linear-oblong, with broad white petaloid tips
A. canadensis, var. *Randii*.
- Basal leaves and those at the tips of the stolons dull above, invested with tomentose or arachnoid pubescence, only the very oldest leaves becoming glabrate.
 Basal leaves mostly long, 5 to 12 (in reduced specimens rarely 4.5) cm. in length. (Large specimens of *A. Brainerdii* might be looked for here.)
 Heads comparatively small, involucre averaging 7 (6 to 8) mm. high: stems slender.
 Basal leaves obovate, with rounded or obtuse tips *A. plantaginea*.
 Basal leaves from obovate-spatulate to oblanceolate, with acute or acutish tips *A. plantaginea*, var. *petiolata*.
 Heads comparatively large, averaging 9 (8 to 10.5) mm. high: stems stouter.
 Basal leaves mostly broadly obovate or rhombic-obovate, tapering gradually to blunt or acutish tips.
 Stems 1 to 2.5 dm. high, bearing some purple glandular hairs above: cauline leaves rather crowded, nearly or quite to the subcapitate inflorescence *A. ambigens*.
 Stems taller, 2.5 to 4 dm. high, not glandular: cauline leaves rather remote *A. fallax*.
 Basal leaves from spatulate to narrowly obovate-spatulate, with rounded tips *A. Farwellii*.
- Basal leaves small, 2 to 5 cm. long. (*A. petaloidea* with slightly developed stolons might be looked for here.)
 Basal leaves spatulate, with little or no differentiation of blade and petiole: involucre lemon-tinged *A. rupicola*.
 Basal leaves with more distinct petioles and obovate blades: involucre not lemon-tinged.
 Stems bearing purple glandular hairs *A. Brainerdii*.
 Stems without glands.
 Cauline leaves linear-attenuate, rather small and inconspicuous, 3 mm. or less wide: involucral bracts with scarious tips.
 Outer bracts obtuse *A. neodioica*.
 All the bracts long-attenuate *A. neodioica*, var. *attenuata*.
 Cauline leaves oblanceolate or oblong-lanceolate, larger and more conspicuous, 5 to 8 mm. wide: bracts with petaloid tips *A. neodioica*, var. *grandis*.
- Stolons, when well developed, procumbent: basal leaves from cuneate-spatulate to obovate, 4 (rarely 5) cm. or less in length.
 Heads in a comparatively loose corymb.
 Involucral bracts with conspicuous blunt or acutish petaloid white tips *A. petaloidea*.
 Involucral bracts scarious, long-attenuate *A. petaloidea*, var. *scariosa*.
 Heads sessile or subsessile in subcapitate clusters, or distinctly racemose *A. neglecta*.

The very large number of specimens recently examined from various parts of New England fall so readily within the defined limits of the species here enumerated, that, although it may yet be necessary to recognize some minor forms, confidence is felt that a very satisfactory

disposition of the northeastern species is now being attained. In view of this fact, it is perhaps appropriate that a summary of our knowledge of the distribution of these plants in New England should now be made. The check-list of species which follows on page 160 will show very quickly that in northern New England the genus *Antennaria* reaches a greater development than further southward. Some of the species, however, now known only from the northern states are to be expected from the other three, while a few forms may yet be expected in Maine, New Hampshire and Vermont. It is hoped that any information (especially if accompanied by specimens) which will further our understanding of these plants will be sent to the writer, who, so far as he is able, will gladly render assistance in the identification of species.

GRAY HERBARIUM.

SUBULARIA AQUATICA ON MT. DESERT ISLAND. — This small and easily overlooked aquatic crucifer is doubtless neither so rare nor so local in its distribution as has been commonly supposed. Stations where it is known to occur, however, are not yet so numerous, that a new one is without interest. In September, 1895, the late Edwin Faxon and I made a careful exploration of the shores of many of the ponds on Mt. Desert Island for *Isoetes* and other water plants, hoping that *Subularia* also might reward our search; and in fact we were successful in finding it in two of the ponds. It was growing both immersed on the sandy shores, and out of water in the mud among stones, and was at the time of collection, in flower as well as in fruit. At the station on Eagle Lake, the immersed plant was in great abundance. Comparatively little of it grew in the clear sand, however, most of the colony being anchored in a great mat of *Fucus militaris*, *Eriocaulon septangulare*, and *Lobelia Dortmanna*. The economy of this manner of living may be readily understood when one notices how easily these little plants are uprooted from the sand by the waves at the time of low water. Only a few emerged plants were found, in fact all the plants here observed would be at least three feet under water the greater part of the year. Since the above observations were made, however, the level of the lake has been raised two to three feet, so that collecting at this station has become very difficult.

At the other pond much the same habits have been observed. More plants, however, grow in the sand and gravel; and a number of